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(54) **DISPENSER FOR DISPENSING THE CONTENTS OF CARTRIDGES WITH ACTUATION LEVER**

(75) Inventors: **Rainer Strobel-Schmidt**, Bad Woerishofen (DE); **Christian Hefele**, Breitenbrunn (DE); **Peter Ostermeier**, Diessen (DE); **Hans Peter Lederle**, Durach (DE)

(73) Assignee: **Hilti Aktiengesellschaft**, Schaan (LI)

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G01F 11/00 (2006.01)

(52) **U.S. Cl.**
USPC **222/391**; 222/327

(58) **Field of Classification Search**
USPC 222/391, 392, 326, 327, 137, 153.13; 81/9.3
See application file for complete search history.

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Primary Examiner — Frederick C Nicolas
Assistant Examiner — Bob Zadeh
(74) *Attorney, Agent, or Firm* — Davidson, Davidson & Kappel, LLC

(57) **ABSTRACT**

A dispenser (**10**) for dispensing the contents of cartridges (**12**), including an advancing mechanism (**14**) for a piston rod (**16**), a housing (**18**) on which a transmission lever (**20**) for actuating the advancing mechanism (**14**) is attached so as to swivel, and a handle (**22**), which is affixed to the housing and to which an actuation lever (**24**) is attached so as to swivel, whereby the transmission lever (**20**) and the actuation lever (**24**) are connected to each other in an articulated manner via a sliding block guide (**26**).

6 Claims, 2 Drawing Sheets

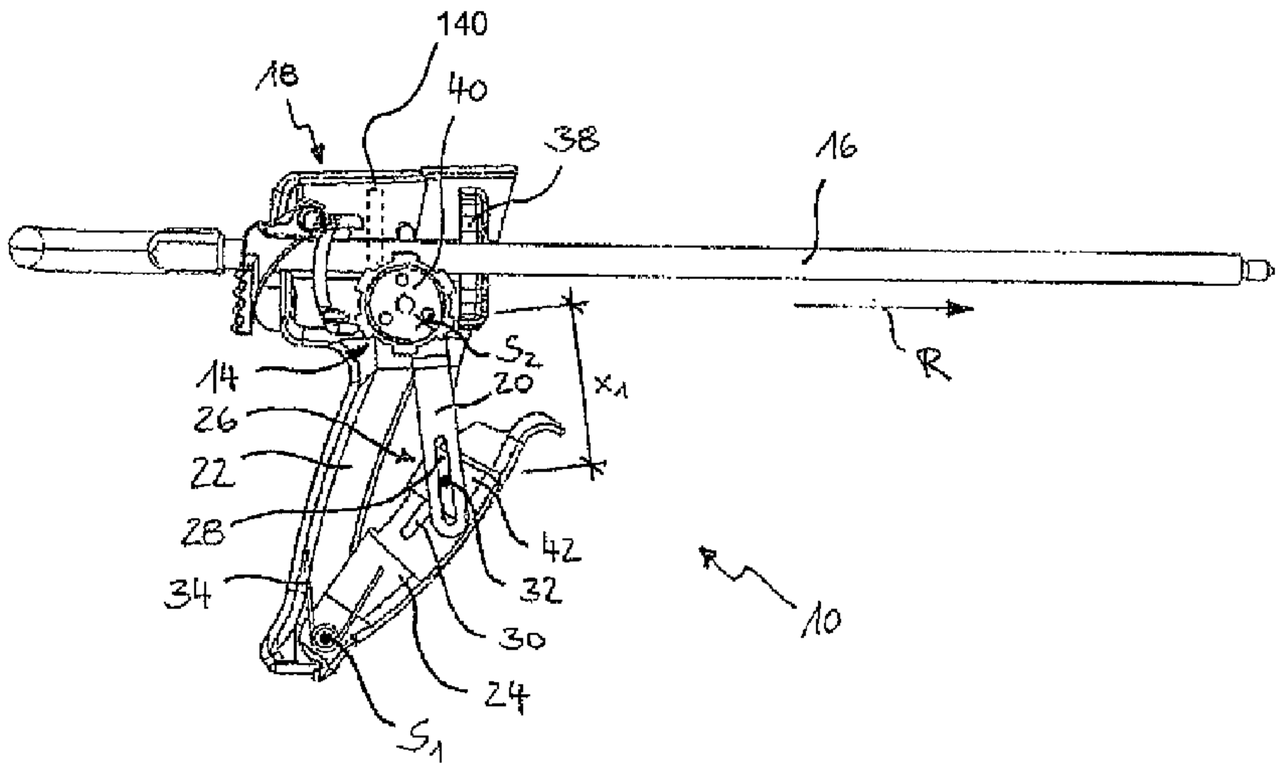
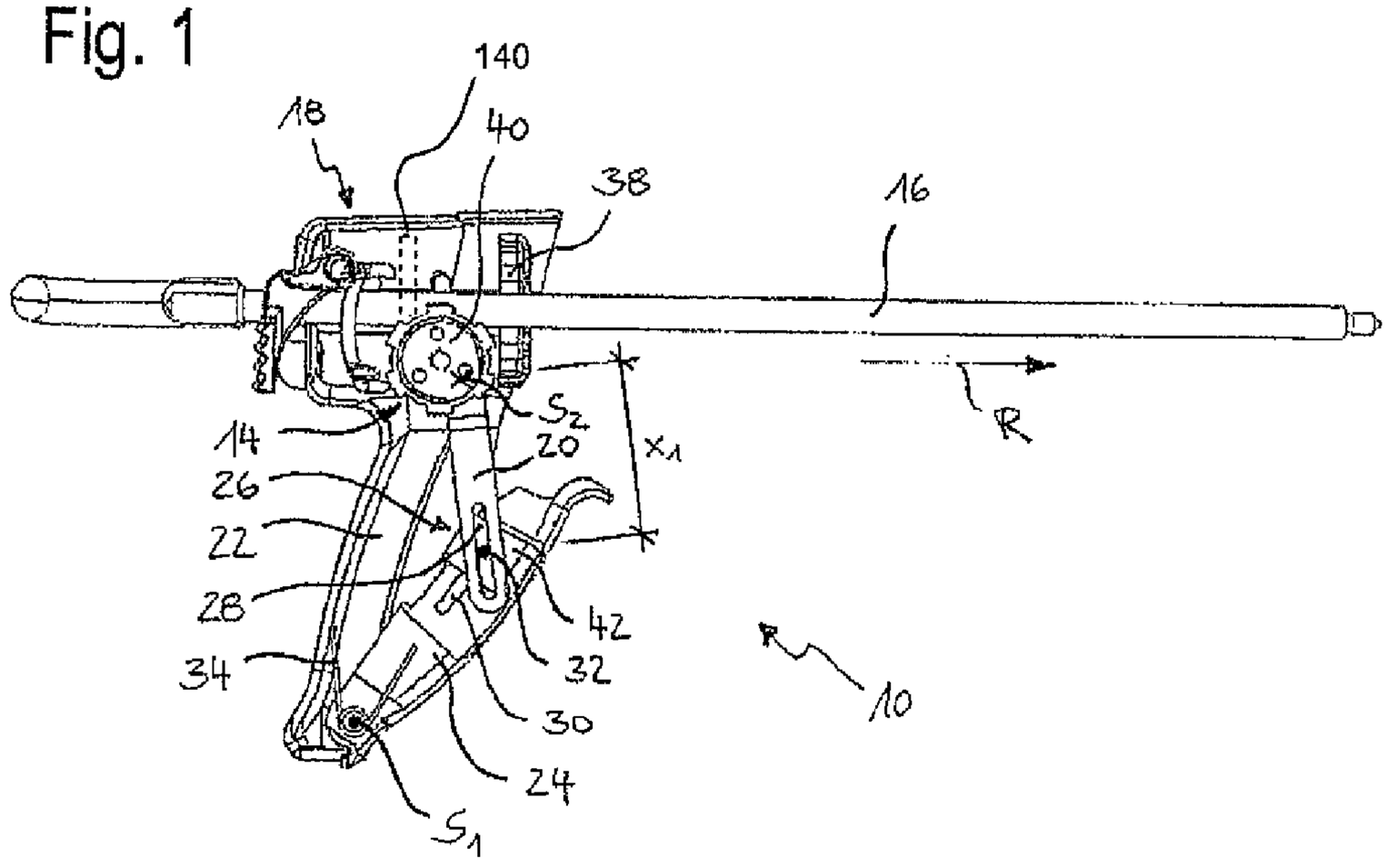


Fig. 1


140
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S_2
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X_1
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28
42
34
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S_1
10
R

Fig. 2

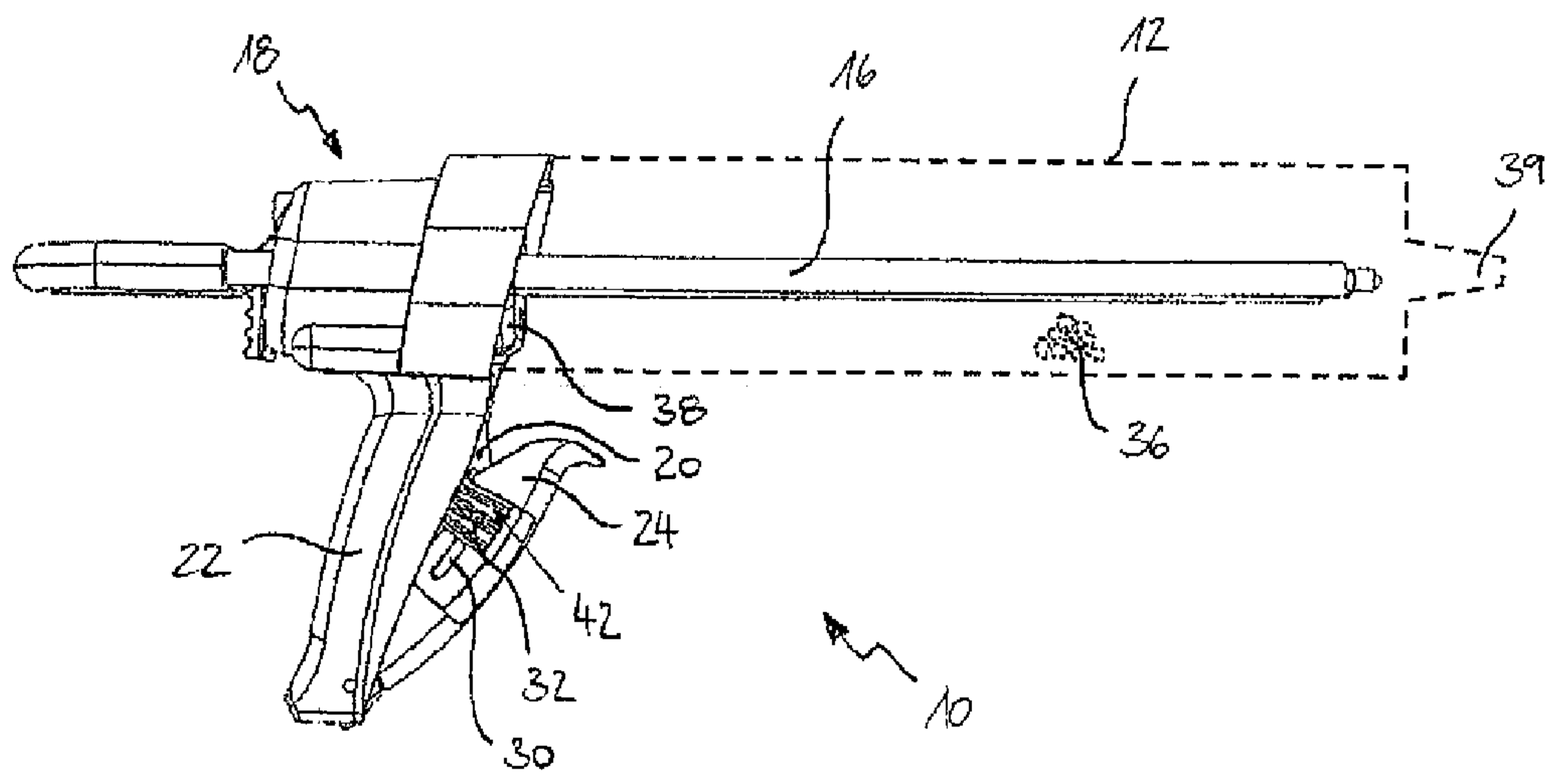
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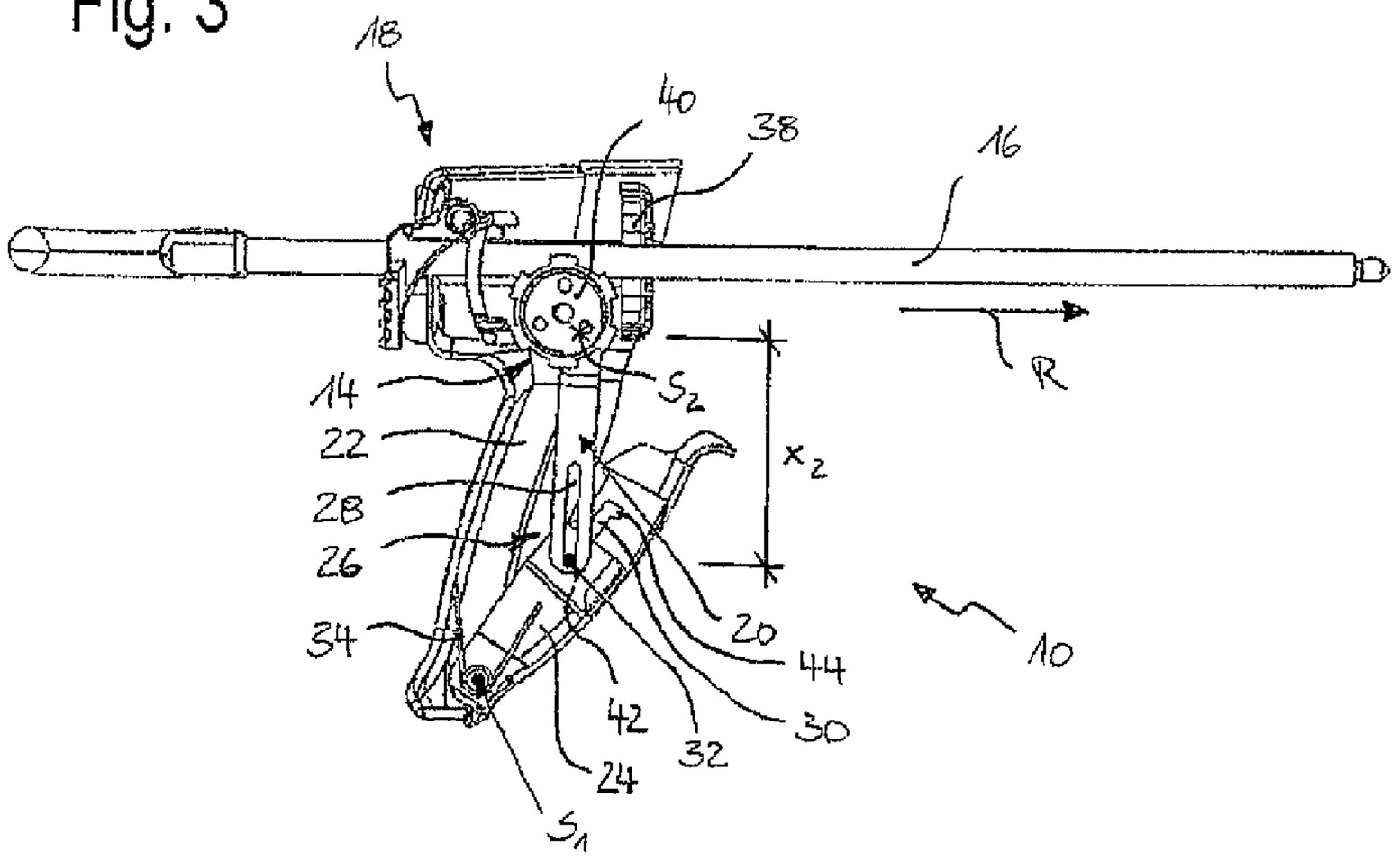
Fig. 3


18
40
38
16
R
14
S_2
22
28
26
x_2
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20
44
10
42
32
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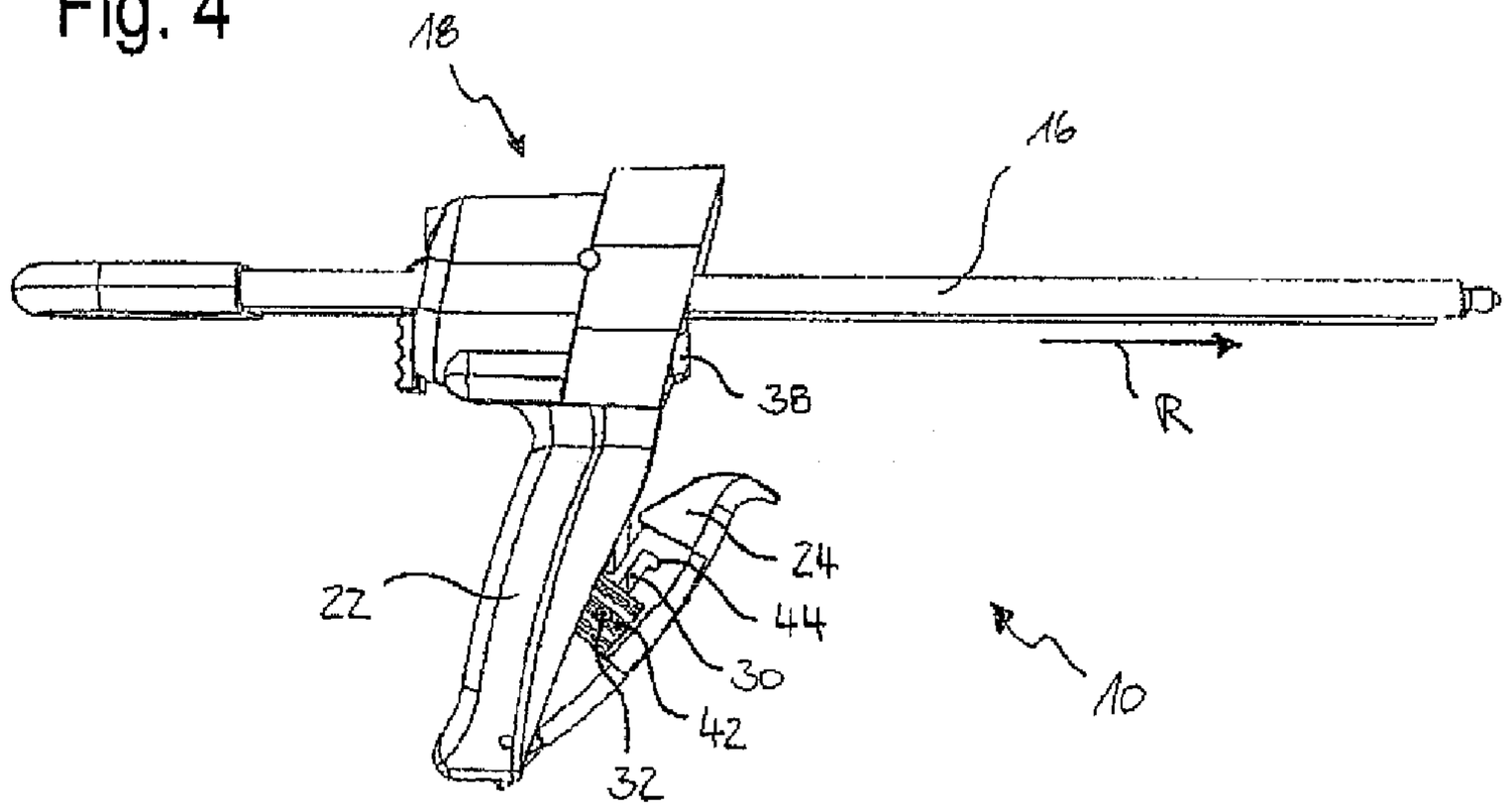
24
S_1

Fig. 4


18
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DISPENSER FOR DISPENSING THE CONTENTS OF CARTRIDGES WITH ACTUATION LEVER

This claims the benefit of German Patent Application DE 10 2011 004 967.3, filed Mar. 2, 2011 and hereby incorporated by reference herein.

BACKGROUND

The invention relates to a dispenser for dispensing the contents of cartridges, comprising an advancing mechanism for a piston rod, a housing on which a transmission lever for actuating the advancing mechanism is attached so as to swivel, and a handle, which is affixed to the housing and to which an actuation lever is attached so as to swivel.

Such dispensers are used, for example, in the construction sector to dispense the contents of cartridges that are filled with silicon or other liquid or viscous construction materials. These cartridges normally have a cylindrical body with a dispensing opening in one of the end walls. The opposite end wall is formed by a plunger that can be moved in the cylindrical body, meaning that moving this end wall changes the volume of the cartridge so that the contents of the cartridge can be expelled out of the dispensing opening. The dispenser allows a precise dosing as well as a precise application of the construction material in question. Normally, the dispenser has a piston that is arranged on a piston rod and that can engage with the plunger and force it against the dispensing opening in order to dispense the contents of cartridge. The piston rod is driven by means of an advancing mechanism that is actuated, for example, by a transmission lever that is attached to a housing so as to swivel. This transmission lever is normally coupled to an actuation lever that is attached to a handle, which is affixed to a housing, so as to swivel.

In the case of conventional dispensers, with each stroke of the actuation lever, an essentially constant volume of construction material is dispensed. In this process, in order to dispense the construction material, the operator has to exert a force that is a function of the viscosity of the construction material. With fairly high-viscosity construction materials, this can cause the operator to quickly become fatigued or he might not even be able to exert the requisite dispensing force. In the case of fairly low-viscosity construction materials, however, the requisite dispensing force is low, and many users have expressed the wish to be able to increase the volume of construction material dispensed per stroke.

In order to overcome this drawback of conventional dispensers, European patent specification EP 0 854 760 B1 discloses a generic dispenser with which the operator can use a knob to continuously adjust the transmission ratio between a stroke of the actuation lever and the volume of construction material dispensed. The continuous setting of the transmission ratio by means of a thread, however, is very time-consuming, especially if a switch-over from one end position (e.g. very high-viscosity construction material) to the other end position (e.g. very low-viscosity construction material) has to be carried out. Moreover, such a continuous fine adjustment of the transmission ratio is usually neither desired nor necessary. As a rule, a two-stage (small/large transmission) or three-stage (small/medium/large transmission) setting would be perfectly satisfactory. Furthermore, the devices employed, especially in the construction sector, are often highly stressed, so that the thread soon becomes difficult to adjust due to dirt or corrosion, or in extreme cases, no longer allows any adjustment at all.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a durable and sturdy dispenser with which the volume of construction material dispensed per stroke of the actuation lever can be changed simply and quickly.

The present invention provides a dispenser of the above-mentioned type, in which the transmission lever and the actuation lever are connected to each other in an articulated manner by means of a sliding block guide. The coupling of the two levers via a sliding block guide is very well-suited for providing an at least two-stage, sturdy and fast setting possibility of the transmission ratio between the stroke of the actuation lever and the volume of construction material dispensed.

In one embodiment, the sliding block guide comprises a sliding block in the transmission lever, a sliding block in the actuation lever, and a slide block peg, whereby the slide block peg engages with the sliding block of the transmission lever as well as with the sliding block of the actuation lever.

In this embodiment, the slide block peg can be configured as a guide pin and the sliding blocks can be configured as slots. For production-related reasons, such a construction is easy to achieve, it allows a quick manual setting, and moreover, it is extremely sturdy.

Preferably, the sliding block of the swiveling actuation lever, relative to its swivel bearing which is affixed to the housing, extends along the actuation lever essentially in the radial direction.

Analogously, the sliding block of the swiveling transmission lever, relative to its swivel bearing which is affixed to the housing, can extend essentially in the radial direction along the transmission lever.

In another embodiment, the swiveling actuation lever has an adjusting slide that, relative to the swivel bearing of the actuation lever which is affixed to the housing, can be moved between a radially inner, first adjustment position and a radially outer, second adjustment position. Thanks to this adjusting slide, the transmission ratio between the stroke of the actuation lever and the volume of construction material dispensed can vary quite simply, namely, by means of just one operation.

The adjusting slide preferably comprises a slide block peg of the sliding block guide.

Moreover, the adjusting slide can be locked in at least one adjustment position.

For this purpose, the sliding block of the actuation lever preferably has an undercut with which the slide block peg can engage, especially by latching. Due to the undercut, the adjusting slide can be affixed and thus a desired transmission ratio can be established in a simple manner. Such an undercut is normally provided in the radially inner, first adjustment position and/or in the radially outer, second adjustment position of the adjusting slide. Furthermore, however, it is also conceivable for such an undercut to be provided in a middle position between the first and second adjustment positions, for example, in order to provide a three-stage adjustability.

In particular, the actuation lever can be coupled to the transmission lever via the sliding block guide in such a way that, when the adjusting slide is moved from its first adjustment position into its second adjustment position, the slide block peg moves closer to the swiveling bearing of the transmission lever, which is affixed to the housing.

In an embodiment of the dispenser, the advancing mechanism has a clamping disc, whereby the transmission lever can engage with the clamping disc.

In an alternative embodiment of the dispenser, the advancing mechanism is a ratchet mechanism, whereby the transmission lever can engage with a drive wheel of the ratchet mechanism.

BRIEF DESCRIPTION OF THE DRAWINGS

Additional features and advantages of the invention can be gleaned from the description of a preferred embodiment given below and making reference to the drawings. These show the following:

FIG. **1** a sectional view of a dispenser according to the invention, whereby an adjusting slide is in a radially outer, first adjustment position;

FIG. **2** a side view of the dispenser according to the invention as shown in FIG. **1**;

FIG. **3** a sectional view of the dispenser according to the invention, whereby the adjusting slide is in a radially inner, second adjustment position; and

FIG. **4** a side view of the dispenser according to the invention as shown in FIG. **3**.

DETAILED DESCRIPTION

FIGS. **1** to **4** each show a dispenser **10** for dispensing the contents of cartridges **12** (indicated in FIG. **2**), comprising an advancing mechanism or advancer **14** for a piston rod **16**, a housing **18** on which a transmission lever **20** for actuating the advancing mechanism **14** is attached so as to swivel, and a handle **22**, which is affixed to the housing **18** and on which an actuation lever **24** is attached so as to swivel.

In the schematic sectional views of FIGS. **1** and **3**, it is clear that the transmission lever **20** and the actuation lever **24** are connected to each other in an articulated manner by means of a sliding block guide **26**. The sliding block guide **26** comprises a sliding block configured as a slot **30** in the actuation lever **24** as well as a slide block peg configured as a guide pin **32**, whereby the slide block peg engages with the sliding block of the transmission lever **20** as well as with the sliding block of the actuation lever **24**.

The actuation lever **24** can be swiveled around a swivel bearing S_1, which is affixed to the housing, relative to the handle **22**, which is affixed to the housing. Here, a spring **34** is provided on the swivel bearing S_1, and this spring acts on the actuation lever **24** in such a way that the lever is swiveled away from the handle **22**. In order to dispense the construction material **36** from the cartridge **12** (see FIG. **2**), an operator has to swivel the actuation lever **24** against the force of the spring **34** in the direction of the handle **22**. Since the actuation lever **24** is coupled via the sliding block guide **26** to the transmission lever **20**, the latter is swiveled around a swivel bearing S_2, which is affixed to the housing and which is indicated in FIGS. **1** and **3**, a process in which it actuates the advancing mechanism **14** of the dispenser **10**.

The advancing mechanism **14** provided on the housing **18** engages with the piston rod **16**, which is movably mounted in the housing **18** in the advancing direction R, and said advancing mechanism **14** forces the piston rod **16** in the advancing direction R. On the piston rod **16**, there is a piston **38** that can be moved against a plunger of the cartridge **12** in order to dispense the construction material **36** contained in the cartridge **12** through a cartridge opening **39**.

In the present case, the advancing mechanism **14** is a conventional ratchet mechanism, whereby the transmission lever **20** engages with a drive wheel **40** of the ratchet mechanism.

As an alternative, the advancing mechanism **14** can also comprise a clamping disc in a known manner, whereby the transmission lever **20** can engage with this clamping disc **140**, which is shown solely schematically in dotted form and extends around piston rod **16**. Since the configuration of the advancing mechanism **14** is largely immaterial for the present invention, the precise construction of the advancing mechanism **14** is not elaborated upon in greater detail here.

Relative to the swivel bearing S_1, which is affixed to the housing, the sliding block or the slot **30** of the swiveling actuation lever **24** extends along the actuation lever **24** essentially in the radial direction.

Analogously, relative to the swivel bearing S_2, which is affixed to the housing, the sliding block or the slot **28** of the swiveling transmission lever **20** extends essentially in the radial direction along the transmission lever **20**.

In the two views of the dispenser **10** according to FIGS. **2** and **4**, it can be clearly seen that the swiveling actuation lever **24** has an adjusting slide **42** that, relative to the swivel bearing S_1 of the actuation lever **24**, which is affixed to the housing, can be moved manually by the user between a radially outer, first adjustment position (see FIG. **2**), and a radially inner, second adjustment position (see FIG. **4**).

According to the sectional views of FIGS. **1** and **3**, the adjusting slide **42** comprises the slide block peg of the sliding block guide **26**, which is configured as a guide pin **32**. The actuation lever **24** is then coupled to the transmission lever **20** via the sliding block guide **26** in such a way that, when the adjusting slide **42** is moved out of its first adjustment position according to FIGS. **1** and **2** into its second adjustment position according to FIGS. **3** and **4**, the guide pin **32** moves away from the swivel bearing S_2 of the transmission lever **20**, which is affixed to the housing.

As a result, a lever arm x on the transmission lever **20** lengthens from a value x_1 to a value x_2.

If the same construction material **36** is used, then the larger lever arm x_2 according to FIG. **3** means that a lower exertion of force dispenses a smaller amount of construction material per stroke, whereas the smaller lever arm x_1 according to FIG. **1** means that a greater exertion of force dispenses a larger amount of construction material per stroke. The term "stroke" refers to a swiveling movement of the actuation lever **24** from its shown, spring-loaded end position into its opposite end position in which it has been swiveled in the direction of the handle **22**.

Thus, the radially outer, first adjustment position of the adjusting slide **42** according to FIGS. **1** and **2** is recommended for fairly low-viscosity construction materials having a low dispensing resistance, since in this case, the operator achieves a fast dispensing of the contents of the cartridge **12** with a small number of strokes.

In contrast, the radially inner, second adjustment position of the adjusting slide **42** according to FIGS. **3** and **4** is recommended for fairly high-viscosity construction materials **36** having a high dispensing resistance, since in this case, the operator achieves a dispensing of the contents of the cartridge **12** with an acceptable amount of force.

In FIGS. **3** and **4**, it can be seen that the sliding block of the actuation lever **24**, which is configured as a slot **30**, has an undercut **44**, with which the guide pin **32** can engage. In a few embodiment variants of the dispenser **10**, the slide block peg is pre-tensioned by a spring element perpendicular to its sliding block path in the direction of the undercut **44**, so the slide block peg latches in the undercut **44** when it reaches said undercut **44**.

Due to such an undercut **44**, the adjusting slide **42** can be locked in an adjustment position. In the present case, the adjusting slide **42** can be affixed in its radially outer, first adjustment position by the undercut **44**. Of course, it is also

conceivable for the sliding block of the actuation lever **24**, which is configured as a slot **30**, to have additional undercuts, for example, so that the adjusting slide **42** can be locked, for example, in its radially inner, second adjustment position or in an intermediate position.

Due to the sliding block guide **26**, the volume of construction material dispensed per stroke can be varied simply and quickly by manually actuating the adjusting slide **42**. At the same time, the construction comprising the sliding block guide **26** and the adjusting slide **42** is very sturdy, so that the dispenser **10** has a very durable functionality and a long service life, provided that it is operated properly.

What is claimed is:

1. A dispenser for dispensing content of a cartridge, comprising:

an advancer for a piston rod;

a housing, a transmission lever for actuating the advancer is attached on the housing so as to swivel;

a handle fixed with respect to the housing; and

an actuation lever attached to the handle so as to swivel, the transmission lever and the actuation lever are connected to each other via a sliding block guide; wherein the sliding block guide comprises a sliding block in the transmission lever, a sliding block in the actuation lever, and a slide block peg, the slide block peg engaging with the sliding block of the transmission lever as well as with the sliding block of the actuation lever.

2. The dispenser as recited in claim **1**, wherein the slide block peg is configured as a guide pin and the sliding blocks in the transmission lever and the actuation lever are configured as slots.

3. The dispenser as recited in claim **1**, wherein the sliding block in the actuation lever, relative to a swivel bearing of the actuation lever fixed with respect to the housing, extends in a radial direction along the actuation lever.

4. A dispenser for dispensing content of a cartridge, comprising:

an advancer for a piston rod;

a housing, a transmission lever for actuating the advancer is attached on the housing so as to swivel;

a handle fixed with respect to the housing; and

an actuation lever attached to the handle so as to swivel, the transmission lever and the actuation lever are connected to each other via a sliding block guide; wherein the actuation lever has an adjusting slide, the adjustable slide, relative to a swivel bearing of the actuation lever fixed with respect to the housing, is movable between a radially outer, first adjustment position and a radially inner, second adjustment position; wherein the adjusting slide comprises a slide block peg of the sliding block guide.

5. The dispenser as recited in claim **4**, wherein the sliding block guide includes sliding block peg and a sliding block of the actuation lever having an undercut, the slide block peg engageable with the undercut.

6. The dispenser as recited in claim **4**, wherein the actuation lever is coupled to the transmission lever via the sliding block guide in such a way that, when the adjusting slide is moved from a first adjustment position into a second adjustment position, the slide block peg moves away from a swiveling bearing of the transmission lever fixed with respect to the housing.

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